

New Jersey Department of Transportation  
Bureau of Research

## Technical Brief

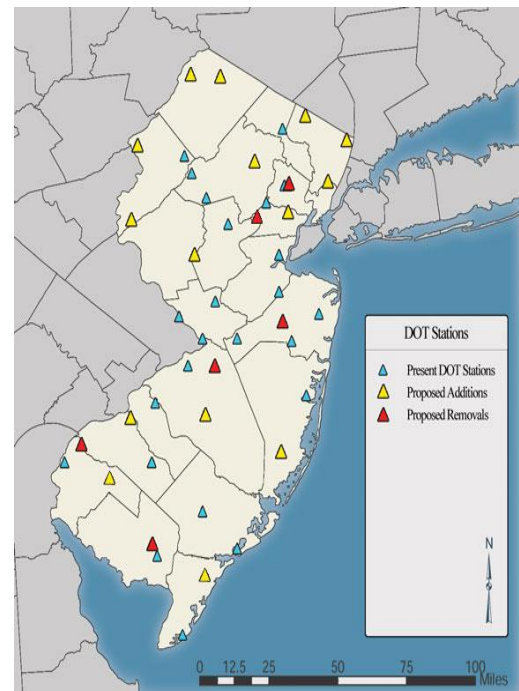


## Roadway Weather Information Sites: Optimum Placement of Stations Across New Jersey

*Weather and climate analyses were undertaken to determine the best locations for Roadside Weather Information Systems (RWIS) stations in New Jersey. The current RWIS network should be expanded into the northern corners and southern areas of the state to effectively grasp the significance of developing events and permit the issuance of timely warnings.*

### Background

The New Jersey Department of Transportation (NJDOT) recognized the need for a network of high-quality observations of atmospheric conditions along the state's roadways. Since the early 1990s, a network of approximately 30 stations, the NJ Roadside Weather Information System (RWIS), has been installed across the state. Since these stations were originally planned to be part of a 100-station network, the first 30 were not installed in the best locations to monitor the wide range of hazardous driving conditions that are often found across the state. While there are no plans to greatly increase the size of the current network, opportunities may exist to install some additional stations, perhaps in part relocating some stations that currently sit close to others. As such, the Office of the New Jersey State Climatologist received funds from the NJDOT to conduct a comprehensive study of the RWIS network in order to assess the effectiveness of the present station distribution with respect to potential meteorological and climatological conditions across New Jersey.



### Research Objectives and Approach

Research objectives and how they were met included:

- Developing a database of quality controlled observations from the RWIS network throughout the project period and incorporating the data into the NJ Weather and Climate Network (NJWxNet) database.
- Evaluating the current effectiveness of the distribution of RWIS stations in monitoring weather conditions throughout New Jersey's road network from a climatological perspective by developing a cyber atlas that includes NJ climatological maps.

[http://climate.rutgers.edu/stateclim/?section=menu&%20target=clim\\_maps](http://climate.rutgers.edu/stateclim/?section=menu&%20target=clim_maps) and undertaking case studies to illustrate rapidly changing NJ weather conditions.

- Recommending an optimal distribution of RWIS stations that best represents the variability of the weather and climate along NJ roadways and generating a series of maps showing recommended placements of new RWIS stations or relocations of current stations.

## Findings

- Adding RWIS data to the NJWxNet database improved statewide weather monitoring.
- This project provided an impetus to change the RWIS from a primarily winter season-only telephone-accessed network to one that is presently accessed daily via cellular transmission.
- New statewide climatologies and case studies of weather events assisted greatly in the evaluation of RWIS placement.
- The climatologies and case studies provided strong support for the need to expand the RWIS network into the northwestern and northeastern corners and southern reaches of the state. They illustrate the variable nature of New Jersey weather, whether it is a plethora of conditions dispersed across the state or rapid changes at an individual location.
- It is our understanding that some of the RWIS observational holes have begun to be filled through several road projects that have provided opportunities for the procurement and installation of RWIS stations. However, some of these stations (e.g., Rt. 18 and River Road in Piscataway) are not in areas with the greatest need for stations.
- It is recommended that decisions regarding future placement of RWIS stations and the number deployed take into account the present and planned location of non-RWIS stations across the state. It may be more cost effective for the NJDOT to support the operation and maintenance of non-RWIS networks than installing new stations.
- It is recommended that RWIS stations be equipped with precipitation gages, ideally heated gages that permit real-time measurement of the liquid content of frozen precipitation. RWIS precipitation gages would assist NJDOT staff, National Weather Service forecasters, and other public and private concerns to immediately grasp the significance of a developing event and permit the issuance of timely warnings.

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A final report is available online at: <http://www.state.nj.us/transportation/refdata/research/>. If you would like a copy of the full report, send an e-mail to: [Research.Bureau@dot.state.nj.us](mailto:Research.Bureau@dot.state.nj.us).

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